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## FILM SCANNING DEVICE (2)

### BACKGROUND OF THE INVENTION

#### TECHNICAL FIELD OF THE INVENTION

The present invention relates to a film scanning device which uses the same lighting device for strip film and slide mount.

#### DESCRIPTION OF RELATED ART

##### Prior technique

A scanner is used to scan the pictures of strip film is concerning the light which read and injected to the film thereafter. The projective light from the photo picture project to the strip film was converted to an image by an image lens and the picture image was read, then the image was treated by relevant necessary corresponding procedures, then the picture data (image data signal) was sent to the picture operating device.

Such a detail scanning device in the publication Number 224688 has been showed in the publication Number 224688 which was published in the Kokai Patent gazette which published in 1999.

The advantages of the prior invention are of the possibilities of the film strip and slide mount, in which the pictures were taken by the same CCD light sensor when the film actuating mechanism. It can be moved by a mount carrier which the plural slide mount and film strip are actuated by the same roller through the up and down movable bar.

However, the complicate operation must be very careful because the components disclosed in the aforesaid prior invention which the slidee mount must be filled into the mount carrier when the pictures of slide mount are scanning.

##### The objects of this invention

In view of the foregoing and other known disadvantages of the prior art, the objects of present invention are to find the solution to resolve the disadvantages which including complicate operation need for the conduction let it became possible to use the same CCD light sensor for both strip film and light mount.

The technique used to achieve the purposes

The feature of present invention is shown in claim 1, a film scanning device that includes:

the first opening was located at the body which for inserting the developed strip film;  
the second opening was located at the body which is an exit for the strip film which was inserted into the first opening;

the third opening was located in front of the body which is for inserting and pulling out the slide mount following the direction vertical to the direction which the strip film was moved;

an actuator which was located at the two sides of the body for actuating the actuating mechanism to move the strip film following the path of a strip film was carried;

a photographic sensor which took the pictures of the strip film was inserted from the first opening and/or the slide mount was inserted from the third opening;

and a projecting light which was used to project the pictures from the photographic sensor.

The second feature of the present invention is shown as claim 2, in which there is the film scanning device as claimed in claim 1, wherein there is at least one location having a transit roller to transit the aforesaid strip film in the actuating mechanism, which is located in the front/behind the direction of the moving direction when the aforesaid photographic sensor scanning the strip film.

The third feature of the present invention is shown as claim 3, in which at least one location having a transit roller to transit the aforesaid strip film in actuating mechanism, in which is located in the front/behind the direction of the moving direction when the aforesaid photographic sensor scanning the strip film, wherein the link.

The carrying roller is actuated independently, the carrying amount variation is happened seems the film is moved not smoothly, however, the two carrying rollers of the present invention are mechanically linked to each other, the variation of carrying amount of a film is never happened, the film is moved in the smooth way.

The whole body of the present invention is small and raises the mobility is getting important. The layout of the carrying mechanism of strip film getting small, mobility is

attempted raised up, the detail description of carrying mechanism of the strip film is located on the both sides corresponding to carrying path of the strip. Means, carrying actuator, linking mechanism which having a carrying mechanism, and the transmit mechanism are all located in the rear two sides and the two front sides of carrying pat are not need any mechanism for it. Therefore, there is room nearby in front of the device, the depth of the insertion of slide mount is the smallest, otherwise a functional device, the whole body is getting smaller.

The term, strip film is used in the text is same as the strip film used in usual. Usually, the strip film is positive film, however, the negative film in the text of present invention is either available in the examples in it. The strip film are used in the examples in present invention.

#### DETAIL DESCRIPTION OF THE EMBODIMENTS

[examples]

The example first showed the whole device in the drawings, positive and negative films are included in strip film (A), slide mount is showed in mount (B), both of them are readable by the same light device. It is very easy to distinguish the carrying mechanism (A1) which include carrying actuator of strip film (A), inserting system (B1) of slide mount (B), and scanning system (C).

The carrying actuator of carrying mechanism (A1) having a body which is composed of three layers, cover (1) is of an always horizon plate, pressed plate (2), and a supporter (3).

In two sides of the cover (1) The strip film (A) is move through the first opening (11) in its long side direction, the first light path (4) will be mentioned later is transited through light source and formed by around the central portion of the second opening (12).

The length of light path (4) is equal to the sum of strip film (A) and slide mount (B), the width of strip film (a) is the difference the perforation subtracted the width, is about the same the width of slide mount (B) is the difference of bar subtracted the width.

Furthermore, the length of cover (1) is from the entrance of the first opening (11) to the second opening, it is desirable 8 coma length of the strip film (A). However, it is not restricted at this length, means any proper length is available.

A press plate (2) is beneath adapting to the cover (1), it was made of thin resin plate,

and the above-mentioned first light (4) is located at its central portion in accordance with the size of the second light path (21).

The both sides of the second light path (21) having one pair of shaft basis (22) which in the width direction of press plate (2). In order to support the two sides of shaft (23), the length of said shaft basis (22) is about the width of press plate (2).

The idling rollers (24) were embedded in the two sides of shaft (23), and a light lug is downward and beneath the press plate (2).

Although strip film (A) is carried from the first opening (11) of the cover (1) to inside the press plate (2), the idling rollers (24) are connected to the upper part of the strip film (A).

One end of (25) in drawings is pressed downward to the middle part of the shaft (23), and the other end is fixed by a plate-form-spring to the proper position of the press plate (2).

There are four outward fossas (26) located at the second light path (21) on the surface of press plate (2). The lugs (15) are lugged from the bottom of the cover (1) in accordance with the fossas (26) on each corresponding position of fossas (26), the relevant position in every direction, front, rear, left and right side are usually maintained constantly.

The bottom of the press plate (2) is contacted and fixed to supporting plate (3), and the central portion of supporting plate (3) having the first light (4) of cover (1) and the third light path (31) which the size in accordance with the second light path (21).

The same matter with the shaft basis (22) of the press plate (2) are right bottom of the third light path (31) are name shaft basis (32), the actuating rollers (34) are embedded to shafts (33) at two sides of the third light path (31). Therefore, the idling rollers (24) of the press plate (2) are corresponding a up-down relation to the rollers (34).

The idling roller (24) and actuating roller (34) have the upper and lower relation and both are the carrying roller of strip film (A). When the photographic sensor scanning the picture from the strip film (A), there is at least one pair of rollers are located at the front and rear places of strip film (A) in the carrying direction of the aperture position.

The rear part of a pair of shafts (33) are slightly lugged outward from the rear part of the supporting plate (3), the carrying part (35) are corresponding to each lug, and said carrying parts are of timing belt (36). Consequently, the corresponding pair of carrying

rollers are mechanically linked to each other.

The rear part of a pair of shafts (33) are slightly lugged outward from the rear part of the supporting plate (3), the carrying part (35) are corresponding to each lug, and said carrying parts are of timing belt (36). One side of the pair of shaft (33) connected to the motor (37) which located at the reduced gear which located at the proper position of the supporting plate (3). Accordingly, the rotating force is transmitted to the actuating roller (34) between the timing belt (36) and shaft (33). This is the carrying mechanism (G). The motor (37) of transmitting mechanism for transmitting actuating force to the carrying mechanism (G) is through the carrying path of the strip film and is located at the rear side of main body (F).

Otherwise, the spring (38) are fixed with the end way coil springs which located at the four corners of the supporting plate (3). The springs (38) are fixed by the devices that are not shown in the drawings.

Parts (39) are located on the two ends of the supporting plate (3), tab hole are located at its front and back sides. Two inside ends of the cover (1) in this example, equivalent to the pair lug balances (13) downward and lugged from the inside of the second opening (12) and the first opening, that is able to maintain good relation between cover (1) and supporting plate (3).

The central line inside the supporting plate (3) are constantly directed to the long hand direction, the width of strip film (A) and the second guide (40) of the strip film are about the same and lightly passed through it, and two end cutting are formed in two sides of the second guide (40).

When press plate (2) is fixed by the cover (1), and together with the supporting plate (3), the first opening (11) of the cover (1) and the inside part of the second opening (12), the first opening (11) and the inside in bottom of the second opening (12) are at the same horizon plate with the second guide (40).

D1 in figure 2 are used to recognize the exist of the strip film (A), through the sensor to determined the position of the strip film. The layout of the aforesaid sensor in present example, in which the insertion of strip film (A) is detected by the sensor in the entrance side. (D2) having a sensor which is used to detect the location the strip film (A) is. (D3) having a sensor which is used to detect the end the strip film (A) was moved.

The inserting system (B1) of the slide mount is same as the strip film system (A2), therefore, the name, symbol of the components of the strip film system (A2) are repeat to be used again.

50 in figure 2, the third opening of slide mount is located the right central portion of the cover (1). Means, strip film (A) is carried through the long hand direction of cover (1) and slide mount (B) is inserted from the direction that right vertical to the shaft line.

The width of the opening (50) is about the width of the slide mount (B), the first guide for slide mount to press plate (2) is located between the inside surface and press plate (2).

52 in figure 2 is used for confirm the insertion is complete when a stop slice is lugged upward to the back of the third opening (50) of press plate (2), at the moment that the slide mount (B) is inserted into the first guide (51), the end of the slide mount (B) is connected to the first guide (52).

The components of scanning system (C) is not big difference from the device we use so far, therefore, it is shown by the figure 2. Projective light (62) is located downward between the end of photographic sensor which is locate the direction that the direction the cover (1) of the slide mount (B) is inserted. The picture sensor (60) is vibratory to front and back direction, the light (62) and scanner (63) are located between strip film (A) and the slide mount (B) when scanning.

[The scanning operation of strip film (A)]

When the scanning of the strip film (A), one end of strip film (A) is inserted to the first opening (11) of the cover (1). The beginning end of strip film (A) is moved in via the carrying path (42) of supporting plate (3) and the inside surface of the press plate (3) from the first opening (11), the insertion of said film (A) is detected by the entrance sensor (D1) of carrying path (42).

The signal of entrance sensor (D1) that motor (37) of the carrying mechanism (G) is started to turn and its rotating force through the timing belt (36) to transmit to the shaft (33), actuating roller (34). Consequently, strip film (A) is moved to the exit between roller (34) and the idling roller (24) of the press plate (2).

The carrying is stop by the signal of location sensor (D2) when the strip film (a) is positioned, means the first light path (4) of the cover (1), the second light path (21) of

supporting plate (2) and the third light path (31) are at the same position.

The scanning is conducted when the position of the strip film (a) is in accordance with the two light paths (21), (31), the light from the light source (62) is transmitted through two light path (21), (31) and the strip film (A).

The scanning of the coma of the whole strip film (A) is over so far. The exit sensor (D3) is located at the supporting plate (3), the detected signal from the end of the strip film (A) is transmitted to the motor (37), and the scanning of the strip film (A) is over because the motor (37) has stop working.

The carrying mechanism of strip film (A) is located at the second guide in the movable side and unified into one body. The first guide located at the way from the photographic sensor (60) of the picture of strip film (A) or slide mount (B) to the path. The distance of the scanner (63) and film of the photographic sensor (60) is minimized, therefore, the body of the device is getting smaller.

[The scanning operation of the slide mount]

Next will be the scanning of the slide mount (B). The slide mount (B) is connected to the first guide (51) from the third opening (50).

As for the insertion of slide mount (B), the view from upper part of the first opening (11) of cover is able to judge the existence and the right position of the insertion, therefore, an identified sensor is not really necessary, it getting better of course.

The scanning is started automatically when the slide mount (B) is carried to the location in accordance with the position of two light paths (21) and (31). It is possible operated by man after the scanning is started.

[Effect]

Neither the strip film nor slide mount need a special scanner device. The scanning is going at the insertion of operation from the first or the second opening.

The same photographic sensor is used for scanning even if the thickness of the strip film and slide mount is different. Therefore, the whole body of the present invention is getting small.

It is available insert the beginning end at the aperture position by manual when the strip film is inserting. Then the carrying is automatic so it is easy to use. Also it is possible to return the film when the end of the film has passed the aperture position, it is very easy

to take back the film device. The situation of unbalance of carrying amount to the film is never happened, the carrying of film is smooth.

The timing belt (36) is used for the example in the present invention, however, it is not restricted present application. The timing belt (36) is replaceable by any device that can be achieved the same purpose.

#### BRIEF DESCRIPTIO OF THE DRAWINGS

Figure 1 is the cast view of scanning device of the example of present invention.

Figure 2 is the expanding view of cover, press plate and supporting plate.

Figure 3 is the front view of a scanning device from outside the case.

Figure 4 is the side view of figure 3.

Figure 5 is the view showing the insertion status of slide mount to the cover and the press plate.

Figure 6 is the view of the embedding status of cover and supporting plate and the three layers of cover, press plate and the supporting plate.